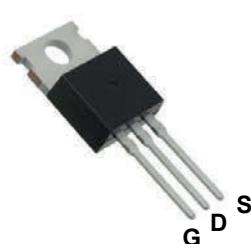
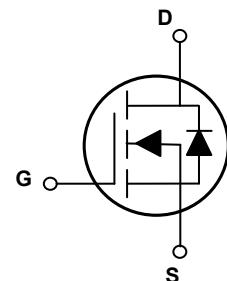


## Main Product Characteristics

$V_{(BR)DSS}$	55V
$R_{DS(ON)}$	8.0mΩ (max.)
$I_D$	110A



TO-220



Schematic Diagram

## Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



## Description

The GSFH3205 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

## Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Parameter.	Unit
Drain-Source Voltage	$V_{DS}$	55	V
Gate-to-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current, @ Steady-State ( $T_C=25^\circ\text{C}$ )	$I_D$	110	A
Continuous Drain Current, @ Steady-State ( $T_C=100^\circ\text{C}$ )		70	A
Pulsed Drain Current	$I_{DM}$	390	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	190	W
		1.27	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy <sup>1</sup>	$E_{AS}$	909	mJ
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$
Junction-to-Case	$R_{\theta JC}$	0.79	$^\circ\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	$T_J/T_{STG}$	-55 to +175	$^\circ\text{C}$

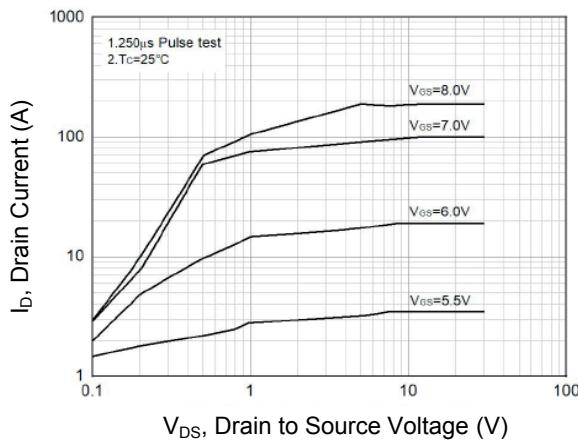
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_D=250\mu\text{A}$	55	-	-	V
Drain-to-Source Leakage Current	$I_{\text{DSS}}$	$V_{\text{DS}}=55\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1.0	$\mu\text{A}$
Gate-to-Source Forward Leakage	$I_{\text{GSS}}$	$V_{\text{DS}}=0\text{V}, V_{\text{GS}}=20\text{V}$	-	-	100	nA
		$V_{\text{DS}}=0\text{V}, V_{\text{GS}}=-20\text{V}$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_D=62\text{A}$	-	7.5	8.0	$\text{m}\Omega$
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}}=V_{\text{GS}}, I_D=250\mu\text{A}$	2.0	-	3.5	V
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{\text{iss}}$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=25\text{V}, F=1\text{MHz}$	-	2365	-	pF
Output Capacitance	$C_{\text{oss}}$		-	740	-	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	169	-	
Total Gate Charge <sup>2,3</sup>	$Q_g$	$I_D=62\text{A}, V_{\text{DS}}=44\text{V}, V_{\text{GS}}=10\text{V}$	-	67	-	nC
Gate-to-Source Charge <sup>2,3</sup>	$Q_{\text{gs}}$		-	13	-	
Gate-to-Drain ("Miller") Charge <sup>2,3</sup>	$Q_{\text{gd}}$		-	35	-	
Turn-on Delay Time <sup>2,3</sup>	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=28\text{V}, V_{\text{GS}}=10\text{V}, I_D=62\text{A}$	-	28	-	nS
Rise Time <sup>2,3</sup>	$t_r$		-	110	-	
Turn-Off Delay Time <sup>2,3</sup>	$t_{\text{d}(\text{off})}$		-	159	-	
Fall Time <sup>2,3</sup>	$t_f$		-	138	-	
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current (Body Diode)	$I_S$	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	110	A
Diode Pulse Current	$I_{\text{SM}}$		-	-	390	A
Diode Forward Voltage	$V_{\text{SD}}$	$I_S=110\text{A}, V_{\text{GS}}=0\text{V}$	-	-	1.3	V
Reverse Recovery Time <sup>2</sup>	$T_{\text{rr}}$	$I_S=110\text{A}, V_{\text{GS}}=0\text{V}, dI/\text{d}t=100\text{A}/\mu\text{s}$	-	67	-	nS
Reverse Recovery Charge <sup>2</sup>	$Q_{\text{rr}}$		-	0.17	-	$\mu\text{C}$

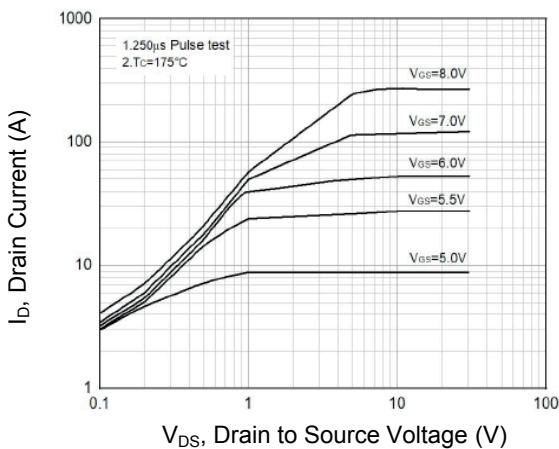
Note:

1.  $L=0.3\text{mH}, I_{\text{AS}}=63\text{A}, V_{\text{DD}}=28\text{V}, R_G=25\Omega$ , starting temperature  $T_J=25^\circ\text{C}$ .
2. Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

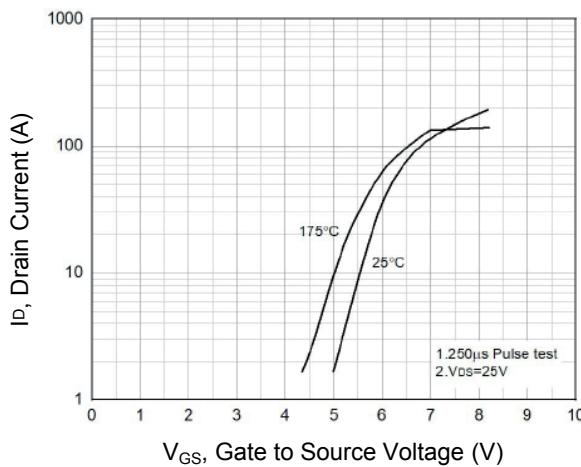
## Typical Electrical and Thermal Characteristic Curves



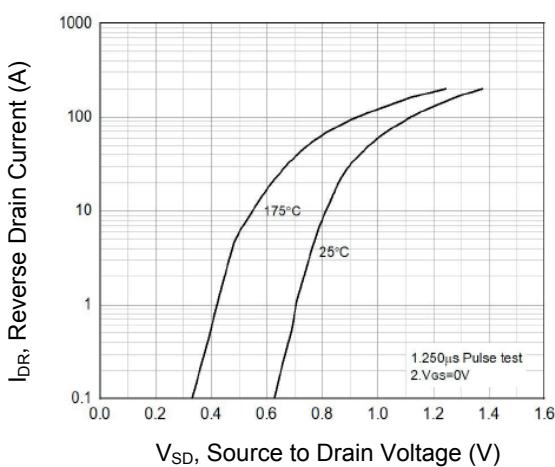
**Figure 1. Typical Output Characteristics**



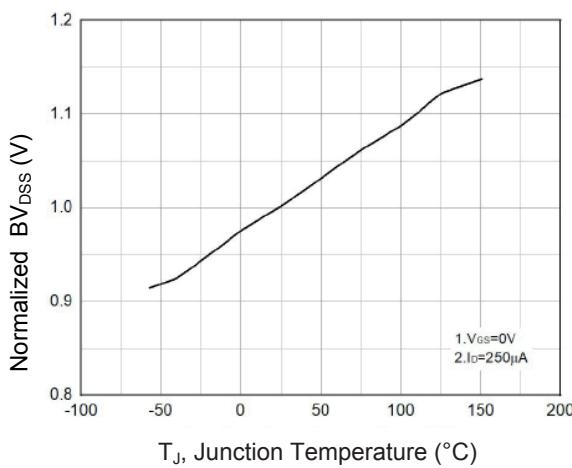
**Figure 2. Typical Output Characteristics**



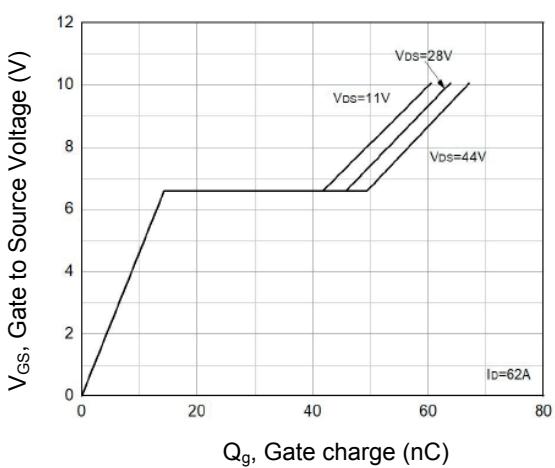
**Figure 3. Transfer Characteristics**



**Figure 4. Body Diode Characteristics**

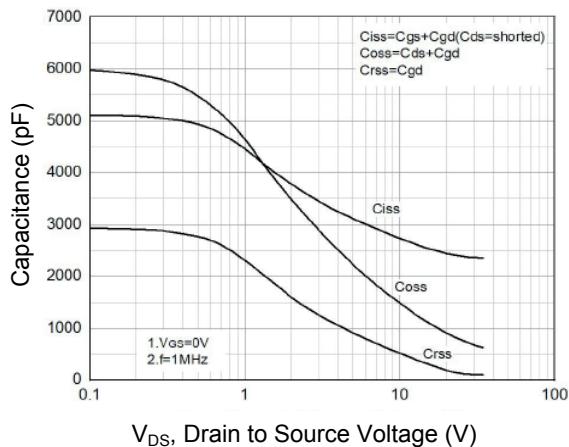


**Figure 5. Normalized  $BV_{dss}$  vs.  $T_j$**

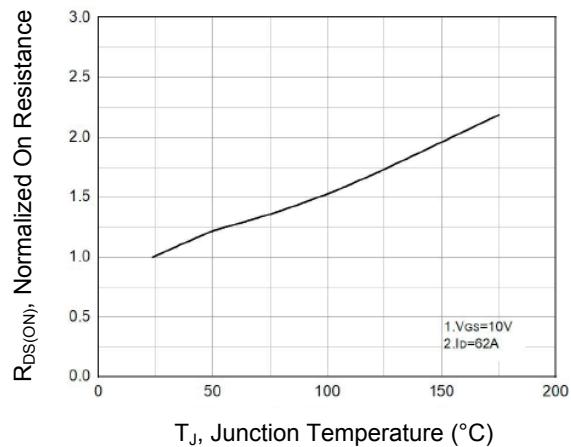


**Figure 6. Gate Charge Characteristic**

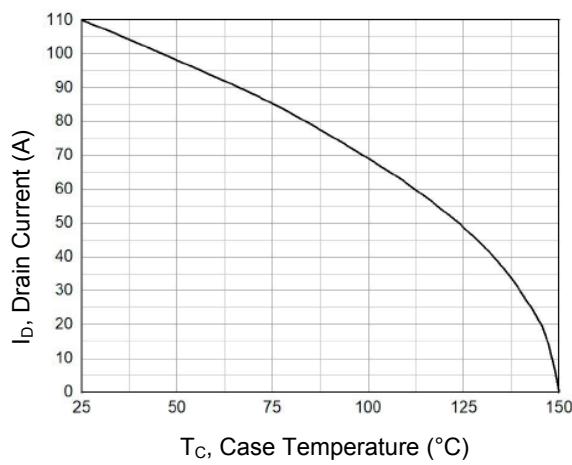
## Typical Electrical and Thermal Characteristic Curves



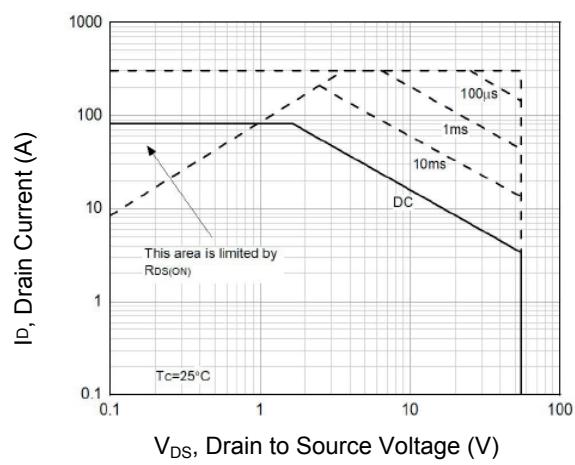
**Figure 7. Capacitance Characteristic**



**Figure 8. Normalized  $R_{D(on)}$  Vs.  $T_J$**

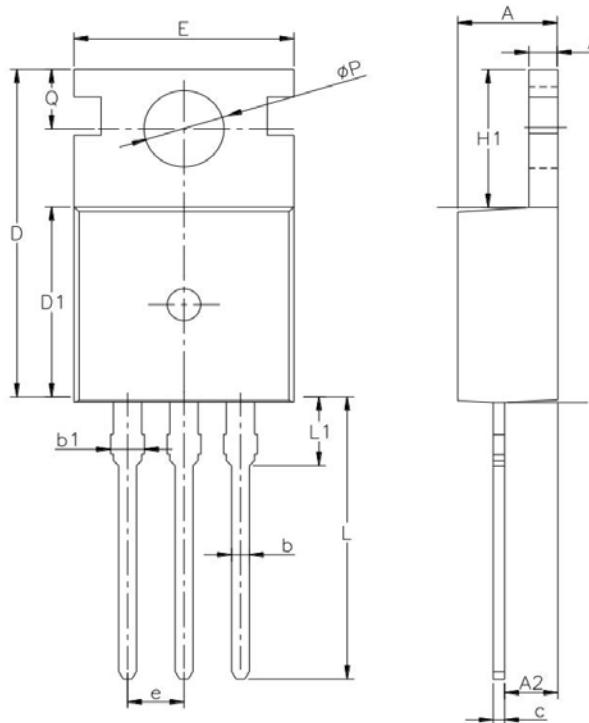


**Figure 9. Drain Current vs.  $T_c$**



**Figure 10. Safe Operation Area**

### Package Outline Dimensions (TO-220)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.30	4.70	0.169	0.185
A1	1.00	1.50	0.039	0.059
A2	1.80	2.80	0.071	0.110
b	0.60	1.00	0.024	0.039
b1	1.00	1.60	0.039	0.063
c	0.30	0.70	0.012	0.028
D	15.10	16.10	0.594	0.634
D1	8.10	10.00	0.319	0.394
E	9.60	10.40	0.378	0.409
e	2.54 BSC		0.100 BSC	
H1	6.10	7.00	0.240	0.276
L	12.60	13.60	0.496	0.535
L1	-	3.95	-	0.156
ΦP	3.40	3.90	0.134	0.154
Q	2.60	3.20	0.102	0.126